

Claims:

1. An optical switch comprising an input side collimator lens array having a plurality of optical fibers to each of which an optical signal is input, a switching mechanism for an optical signal path, and an output side collimator lens array having optical fibers that output switched optical signals,

wherein at least one of said input side collimator lens array and said output side collimator lens array comprises:

a first substrate having mounting grooves which are formed in a main surface of said first substrate and in each of which a corresponding collimator lens in optical communication with the optical fiber is mounted, and first positioning grooves formed in said main surface;

a second substrate having mounting grooves which are formed in a main surface of said second substrate and in each of which a corresponding collimator lens in optical communication with the optical fiber is mounted, and through-holes; and

positioning members respectively arranged between said first positioning grooves and first through-holes.

2. The optical switch according to claim 1, wherein said second substrate has second positioning grooves in the main surface in which the mounting grooves are formed.

3. The optical switch according to claim 1, wherein at least one of said first positioning grooves and said through-holes are formed by surfaces along a crystal face of said substrate.

4. The optical switch according to claim 1, wherein the collimator lens are respectively arranged in the mounting grooves formed in at least one of said input side collimator lens array and said output side collimator lens array, via an elastic member having a smaller elastic modulus than the substrate in which said mounting grooves are formed.

5. The optical switch according to claim 1, wherein said through-holes are formed from the same side as that in which said mounting grooves are formed.

6. The optical switch according to claim 1, wherein a plurality of collimator lens accommodating grooves are formed in each of said first and second substrates.

7. The optical switch according to claim 1, wherein an upper end of each of said positioning members mounted between said substrates is formed higher than an upper end of each of the collimator lenses mounted on said first substrate.

8. An optical switch comprising an input side collimator lens array having a plurality of optical fibers to each of which an optical signal is input, a switching mechanism for an optical signal path, and an output side collimator lens array having optical fibers

that output switched optical signals,

wherein at least one of said input side collimator lens array and said output side collimator lens array comprises:

a first substrate having first mounting grooves which are formed in a main surface of said first substrate and in each of which a first collimator lens is mounted, first positioning grooves arranged at both sides of said mounting grooves; second positioning grooves formed in a surface opposite to said main surface and at both sides of an area corresponding to an area in which said mounting grooves are formed;

a second substrate arranged opposite said main surface of said first substrate, and having third mounting grooves formed in a surface of said second substrate which is opposite said first substrate and at positions opposite to said first positioning grooves;

a third substrate arranged opposite said opposite surface of said first substrate, and having fourth positioning grooves formed in a surface of said third substrate which is opposite said first substrate and at positions opposite to said second positioning grooves;

first positioning members arranged between said first positioning grooves and third positioning grooves; and

second positioning members arranged between said second positioning grooves and fourth positioning

grooves,

wherein said first positioning groove located in a first direction with respect to the mounting grooves of the first substrate is formed in an area located at a distance larger than a distance from the mounting grooves till the second positioning groove, and

said first positioning groove located in an opposite direction of the first direction with respect to the mounting grooves of the first substrate is formed in an area located at a distance smaller than the distance from the mounting grooves till the corresponding second positioning groove.

9. A collimator lens array comprising a plurality of collimator lenses in communication with optical fibers, said collimator lens array comprising:

a first substrate having first mounting grooves which are formed in a main surface of said first substrate and in each of which a first collimator lens is mounted, first positioning grooves formed with said mounting grooves between; second positioning grooves formed in a surface opposite to said main surface and with an area corresponding to an area in which said mounting grooves are formed between;

a second substrate arranged opposite said main surface of said first substrate, and having third mounting grooves formed in a surface of said second substrate which is opposite said first substrate and at

positions opposite to said first positioning grooves;

a third substrate arranged opposite said opposite surface of said first substrate, and having fourth positioning grooves formed in a surface of said third substrate which is opposite said first substrate and at positions opposite to said second positioning grooves;

first positioning members arranged between said first positioning grooves and third positioning grooves; and

second positioning members arranged between said second positioning grooves and fourth positioning grooves,

wherein said first positioning groove located in a first direction with respect to the mounting grooves of the first substrate is formed in an area located at a distance larger than a distance from the mounting grooves till the second positioning groove, and

said first positioning groove located in an opposite direction of the first direction with respect to the mounting grooves of the first substrate is formed in an area located at a distance smaller than the distance from the mounting grooves till the corresponding second positioning groove.

10. A collimator lens array comprising a plurality of collimator lenses in communication with optical fibers, said collimator lens array comprising:

a first substrate having first mounting grooves which are formed in a main surface of said first substrate and in each of which a first collimator lens is mounted, first positioning grooves arranged said mounting grooves between; second positioning grooves arranged in a surface opposite to said main surface and with an area corresponding to an area in which said mounting grooves are formed between;

a second substrate arranged opposite said main surface of said first substrate, and having third mounting grooves formed in a surface of said second substrate which is opposite said first substrate and at positions opposite to said first positioning grooves;

a third substrate arranged opposite said opposite surface of said first substrate, and having fourth positioning grooves formed in a surface of said third substrate which is opposite said first substrate and at positions opposite to said second positioning grooves;

first positioning members arranged between said first positioning grooves and third positioning grooves;

second positioning members arranged between said second positioning grooves and fourth positioning grooves, and

a pressing mechanism that presses said second substrate and said third substrate against said first substrate.